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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,465	09/23/2003	Kazuhiro Mochinaga	2003_1343A	9043

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EXAMINER	
SAINT CYR, LEONARD	
ART UNIT	**PAPER NUMBER**
2626	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/17/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/667,465	Applicant(s) MOCHINAGA ET AL.
	Examiner Leonard Saint-Cyr	Art Unit 2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 –5, 14, 15, and 25 – 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Pitman et al., (US PAP 2002/0143530).

As per claim 1, Pitman et al., a feature quantity extracting apparatus comprising: a frequency transforming section for performing a frequency transform on a signal portion corresponding to a prescribed time length, which is contained in an inputted audio signal, to derive a frequency spectrum from the signal portion ("the audio signal is sampled and a frequency transform is performed on a succession of set of samples"; Abstract, lines 1 –3; paragraph 30, lines 5 - 7);

a band extracting section for extracting a plurality of frequency bands from the frequency spectrum derived by the frequency transforming section and for outputting band spectra which are respective frequency spectra of the extracted frequency bands ("frequency bands"; Abstract, lines 5, and 6; paragraph 32, line 11); and

a feature quantity calculating section for calculating respective prescribed feature quantities of the band spectra, the feature quantity calculating section obtaining the calculated prescribed feature quantities as feature quantities of the audio signal ("extract features from unknown audio content"; paragraph 33; paragraph 54).

As per claim 2, Pitman et al., further disclose that the band extracting section extracts the plurality of frequency bands obtained by dividing the frequency spectrum, which has been derived by the frequency transforming section, at uniform intervals on a linear scale of a frequency axis ("sampling an audio signal at a rate of 22050 Hz... each of which has a duration of 2/21.5 seconds and includes 2048 samples"; paragraph 30, lines 18 – 22).

As per claim 3, Pitman et al., further disclose that the band extracting section extracts the plurality of frequency bands obtained by dividing the frequency spectrum, which has been derived by the frequency transforming section, at uniform intervals on a logarithmic scale of a frequency axis ("logarithmic scale"; paragraph 32).

As per claim 4, Pitman et al., further disclose that the band extracting section extracts only frequency bands within a prescribed frequency range from the frequency spectrum derived by the frequency transforming section ("a best match can be reported for each predetermined interval"; paragraph 54).

As per claim 5, Pitman et al., further disclose that the band extracting section extracts frequency bands so as to generate a prescribed space between adjacent frequency bands extracted ("equally spaced"; paragraph 32; paragraph 52, lines 11 - 13).

As per claim 14, Pitman et al., further disclose that the feature quantity calculating section calculates, as the prescribed feature quantities, effective values of respective frequency spectra of the frequency bands ("running average is taken of each semitone frequency band"; Abstract, lines 6, and 7).

As per claim 15, Pitman et al., further disclose that the frequency transforming section extracts from the audio signal the signal portion corresponding to a prescribed time length at prescribed time intervals ("the audio signal is sampled and a frequency transform is performed on a succession of set of samples"; Abstract, lines 1 –3; paragraph 30, lines 5 - 7), and

wherein the feature quantity calculating section includes: an effective value calculating section for calculating effective values of respective frequency spectra of the band spectra ("running average is taken of each semitone frequency band"; Abstract, lines 6, and 7); and

an effective value time variation calculating section for calculating, as the prescribed feature quantities, numerical values related to respective time variation

quantities of the effective values calculated by the effective value calculating section ("a sequence of numerical values of frequency"; paragraph 49, lines 1 – 5).

As per claim 25, Pitman et al., teach a feature quantity extracting apparatus comprising: a frequency transforming section for performing a frequency transform on a signal portion corresponding to a prescribed time length, which is contained in an inputted audio signal, to derive frequency spectra from the signal portion ("the audio signal is sampled and a frequency transform is performed on a succession of set of samples"; Abstract, lines 1 –3; paragraph 30, lines 5 - 7);

an envelope curve deriving section for deriving envelope signals which represents envelop curves of the frequency spectra derived by the frequency transforming section ("spectrum information"; paragraph 32, lines 8 – 11); and

a feature quantity calculating section for calculating, as feature quantities of the audio signal, numerical values related to respective extremums of the envelope signals derived by the envelope curve deriving section ("local maximum or minimum"; paragraph 35, lines 1 – 3).

As per claim 26, Pitman et al., further disclose that the feature quantity calculating section obtains, as the feature quantities of the audio signal, extremum frequencies each being a frequency corresponding to one of the extremums of the envelope signals derived by the envelope curve deriving section ("an extremum in a semitone frequency channel"; paragraph 35, lines 1 – 3).

As per claim 27, Pitman et al., further disclose that the feature quantity calculating section includes: an extremum frequency calculating section for calculating the extremum frequencies each being a frequency corresponding to one of the extremums of the envelope signals derived by the envelope curve deriving section ("an extremum in a semitone frequency channel"; paragraph 35, lines 1 – 3); and

a space calculating section for calculating spaces between adjacent extremum frequencies as the feature quantities of the audio signal ("evenly spaced frequency band"; paragraph 32).

As per claim 28, Pitman et al., further disclose that the space calculating section obtains, as the feature quantities of the audio signal, numerical values which represent a space as a ratio to a prescribed reference value ("equally spaced on a logarithmic scale"; paragraph 32, lines 1 – 4).

As per claims 29, and 30, Pitman et al., further disclose that the space calculating section obtains, as the prescribed reference value, the lowest of the extremum frequencies; a value of difference between the lowest and the second lowest of the extremum frequencies ("evenly spaced frequency band"; paragraph 35, lines 1 – 4; paragraph 32).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6 – 13, 16 – 24, and 31 – 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pitman et al., (US PAP 2002/0143530) in view Ellis et al., (US Patent 5,504,518).

As per claim 6, Pitman et al., do not specifically teach that the feature quantity calculating section calculates peak values corresponding to values at respective peaks of the band spectra, and obtains, as the prescribed feature quantities, values of difference between peak values of frequency bands.

Ellis et al., teach that segment recognition sub-system may detect multiple matches on a given key signature for consecutive frames; examines the run structure in the segment signature and generates an anticipated peak value width therefrom (col.45, lines 25 – 31).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to generate a peak value among consecutive frames as taught by Ellis et al., in Pitman et al., because that would help better identify the audio content.

As per claim 7, Ellis et al., further disclose the feature quantity calculating section uses binary values to represent the values of difference between peak values of

frequency bands, the binary values indicating a sign of a corresponding one of the values of difference ("binary value"; col.15, lines 37 – 40).

As per claim 8, Pitman et al., do not specifically teach that the feature quantity calculating section calculates peak frequencies corresponding to frequencies at respective peaks of the band spectra, and obtains, as the prescribed feature quantities, numerical values related to the calculated peak frequencies.

Ellis et al., teach that segment recognition sub-system may detect multiple matches on a given key signature for consecutive frames; examines the run structure in the segment signature and generates an anticipated peak value width therefrom (col.45, lines 25 – 31).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to generate a peak value among consecutive frames as taught by Ellis et al., in Pitman et al., because that would help better identify the audio content.

As per claim 9, Ellis et al., further disclose that the feature quantity calculating section calculates, as the prescribed feature quantities, values of difference between peak frequencies of frequency bands ("detect multiple matches on a given key signature for consecutive frames, and generate an anticipated peak value"; col.45, lines 25 – 31).

As per claim 10, Ellis et al., further disclose that the feature quantity calculating section represents the prescribed feature quantities using binary values indicating

whether a corresponding one of the values of difference between peak frequencies of frequency bands is greater than a prescribed value ("one binary value for positive elements"; col.15, lines 37 – 40).

As per claim 11, Pitman et al., further disclose that the frequency transforming section extracts from the audio signal the signal portion corresponding to a prescribed time length at prescribed time intervals ("the audio signal is sampled and a frequency transform is performed on a succession of set of samples"; Abstract, lines 1 –3; paragraph 30, lines 5 - 7).

However, Pitman et al., do not specifically teach a peak frequency calculating section for calculating peak frequencies corresponding to frequencies at respective peaks of the band spectra; and a peak frequency time variation calculating section for calculating, as the prescribed feature quantities, numerical values related to respective time variation quantities of the peak frequencies calculated by the peak frequency calculating section.

Ellis et al., teach that segment recognition sub-system may detect multiple matches on a given key signature for consecutive frames; examines the run structure in the segment signature and generates an anticipated peak value width therefrom (col.45, lines 25 – 31).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to generate a peak value among consecutive frames as taught by Ellis et al., in Pitman et al., because that would help better identify the audio content.

As per claim 12, Ellis et al., further disclose that the peak frequency time variation calculating section obtains, as the prescribed feature quantities, binary values indicating a sign of a corresponding one of the time variation quantities of the peak frequencies ("binary value"; col.15, lines 37 – 40).

As per claim 13, Ellis et al., further disclose that the peak frequency time variation calculating section obtains, as the prescribed feature quantities, binary values indicating whether a corresponding one of the time variation quantities of the peak frequencies is greater than a prescribed value ("one binary value for positive elements"; col.15, lines 37 – 40).

As per claim 16, Pitman et al., do not specifically teach that binary values indicating a sign of a corresponding one of the time variation quantities of the effective values.

Ellis et al., teach that positive elements of the vector are assigned one binary value, while negative elements are assigned the other binary value (col.15, lines 37 – 41).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use binary values as taught by Ellis et al., in Pitman et al., because that would help determine when the peak value is either positive or negative.

As per claim 17, Pitman et al., do not specifically teach that the effective value time variation calculating section obtains, as the prescribed feature quantities, binary values indicating whether a corresponding one of the time variation quantities of the effective values is greater than a prescribed value.

Ellis et al., teach that positive elements of the vector are assigned one binary value, while negative elements are assigned the other binary value (col.15, lines 37 – 41).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use binary values as taught by Ellis et al., in Pitman et al., because that would help determine when the peak value is either positive or negative.

As per claim 18, Pitman et al., further disclose that the frequency transforming section extracts from the audio signal the signal portion corresponding to a prescribed time length at prescribed time intervals ("the audio signal is sampled and a frequency transform is performed on a succession of set of samples"; Abstract, lines 1 –3; paragraph 30, lines 5 - 7).

However Pitman et al., do not specifically teach calculating section calculates a cross-correlation value between a frequency spectrum of a frequency band extracted by the band extracting section and another frequency spectrum on the same frequency band in a signal portion different from the signal portion from which the frequency band extracted by the band extracting section is obtained, the cross-correlation value being calculated for each frequency band extracted by the band extracting section, and the

feature quantity calculating section using, as the feature quantities, numerical values related to the cross-correlation values.

Ellis et al., teach producing signatures characterizing respective intervals of a broadcast signal exhibiting correlation between at least some of said respective intervals for use in broadcast segment recognition. The correlator performs the requested matching operation and supplies the match results, along with the relevant information such as corresponding error count (col.5, lines 16 – 19; col.11, lines 8 – 11).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine correlation between some intervals as taught by Ellis et al., in Pitman et al., because that would help better identify the audio content by supplying matching results to the segment recognition.

As per claim 19, Pitman et al., further disclose that binary values indicating a sign of a corresponding one of the cross-correlation values (col.15, lines 37 – 41).

As per claim 20, Pitman et al., further disclose that the feature quantity calculating section calculates, as the prescribed feature quantities, numerical values related to respective time variation quantities of the calculated cross-correlation values ("numerical values of frequency"; paragraph 49, lines 1 – 3).

As per claim 21, Pitman et al., teach a feature quantity extracting apparatus comprising: a signal extracting section for extracting from an extracted audio signal a

plurality of signal portions each corresponding to a prescribed time length ("extract features from unknown audio content"; paragraph 54, lines 1 - 10);

However Pitman et al., do not specifically teach calculating a cross-correlation value between one of the plurality of signal portions extracted by the signal extracting section and another of the plurality of signal portions, the feature quantity calculating section obtaining a numerical value related to the calculated cross-correlation value as a feature quantity of the audio signal.

Ellis et al., teach producing signatures characterizing respective intervals of a broadcast signal exhibiting correlation between at least some of said respective intervals for use in broadcast segment recognition. The correlator performs the requested matching operation and supplies the match results, along with the relevant information such as corresponding error count (col.5, lines 16 – 19; col.11, lines 8 – 11).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine correlation between some intervals as taught by Ellis et al., in Pitman et al., because that would help better identify the audio content by supplying matching results to the segment recognition.

As per claim 22, Ellis et al., further disclose that the feature quantity calculating section obtains the cross-correlation value as the feature quantity of the audio signal ("supplies a match report for each audio"; col.11, lines 8 – 13).

As per claim 23, Ellis et al., further disclose that the feature quantity calculating section obtains a binary value as the feature quantity of the audio signal, the binary value indicating a sign of the cross-correlation value ("binary value"; col.15, lines 37 – 40).

As per claim 24, Ellis et al., further disclose that the signal extracting section extracts the signal portions at prescribed time intervals, and wherein the feature quantity calculating section includes: a cross-correlation value calculating section for calculating the cross-correlation value at the prescribed time intervals; and a cross-correlation value time variation calculating section for calculating a time variation quantity of the cross-correlation value as the feature quantity of the audio signal ('correlation between at least some of said respective intervals for use in broadcast segment recognition ; and supplies a match report for each audio"; col.11, lines 8 – 13).

As per claims 31 - 33, Pitman et al., teach a recording medium; and a feature quantity storage section which stores at least a set of a feature quantity of an audio signal and control instruction information associated therewith, (paragraph 54; paragraph 25).

However Pitman et al., do not specifically teach receiving television program data containing an audio signal and a video signal, and is capable of recording the television program data to a recording medium, wherein the feature quantity extracting apparatus obtains a feature quantity of the audio signal contained in the television program data,

wherein the program recording apparatus further comprises: a recording control section for controlling recording of the television program data to the recording medium; the audio signal containing music played in a television program to be recorded, the control instruction information instructing the recording control section to perform or stop recording of the television program; a feature quantity comparison section for determining whether the audio signal contained in the television program data matches with the audio signal containing the music played in the television program based on both the feature quantity obtained by the feature quantity extracting apparatus and the feature quantity stored in the feature quantity storage section, and wherein when the feature quantity comparison section determines that the audio signal contained in the television program data matches with the audio signal containing the music played in the television program, the recording control section performs the control of performing or stopping recording of the television program data to the recording medium in accordance with an instruction indicated by control instruction information which is stored in the feature quantity storage section and associated with a feature quantity of the audio signal having been determined as matching with the audio signal containing the music played in the television program.

Ellis et al., teach receiving television broadcast signals over a respective channel and demodulates the received signals to provide baseband video and audio signals. The video and audio signals are thereafter supplied to the segment recognition subsystem wherein frames signatures for each of the video and audio signals are generated which are thereafter compared to store key signatures to determine if a

match exists (col.9, lines 55 – 62). The FIR module serve to improve signature stability by averaging the audio spectral data over a number of television frames, thus to enhance the likelihood of obtaining correct signatures matches (col.21, lines 64 – 67).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to match audio in a television broadcast as taught by Ellis et al., in Pitman et al., because that would help verify whether video and audio signals are synchronized during television broadcasting.

As per claim 34, Ellis et al., further disclose that the program reproduction control apparatus further comprises an editing section capable of editing the television program data recorded in the recording medium (updating a broadcast segment recognition database storing signatures"; col.5, lines 2, and 3).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Obrador et al., (US Patent 7,184,955) teach a system and method for indexing video based on speaker distinction.

Kenyon et al., (US 4,450,531) teach broadcast signal recognition system and method.

Lamb et al., (US Patent 5,437,050) teach a method and apparatus for recognizing broadcast information using multi-frequency magnitude detection.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard Saint-Cyr whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS
04/12/07

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